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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS : Castell, et al.

TITLE : System, Method and Mobile Device for Remote Control of a Voice Mail System

SERIAL NO. : 10/051,697

FILING DATE : 01/18/2002

EXAMINER : Chow, M.

GROUP ART UNIT : 2645

ATTORNEY DOCKET NO. : 555255012306

### Declaration of Prior Invention to Overcome Cited Patents Under 37 C.F.R. § 1.131

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

This Declaration is submitted by the undersigned inventors to establish that the subject matter described and claimed in this application was invented prior to December 4 2000, which is the filing date of US 6,580,784 to Rodriguez ("Rodriguez").

We, William D. Castell, Gary P. Mousseau and Mihal Lazaridis, the inventors of United States Patent Application S/N 10/051,697, titled "System, Method and Mobile Device for Remote Control of a Voice Mail System," declare as follows:

1. Prior to December 4, 2000, we conceived of the subject matter described and claimed in the above-titled patent application. Evidence of this conception is set forth at Tab A

hereto. The document at Tab A is titled "The PBX Monitor." This document describes the invention disclosed and claimed in this patent application, and, in particular, discloses a system in which a wireless mobile communication device can be used to control an associated voice mail system. An example diagram of the system is shown at page 3 of the document. The methodology is further described at page 4 of the document as follows:

"1. Path (1) shows phone call arriving in from the office or from the outside world, all calls eventually reach the PBX and the PBX Monitor should monitor calls for Blackberry users.

2. Path (2) takes place if a call is not picked up, and the call is for a configured Blackberry user (based on extension), the PBX Monitor will divert the call to the Blackberry voice mailbox. NOTE: When this takes place the PBX Monitor should be flexible enough to emulate the existing voice mailbox methods for user interaction.

3. Path (3) illustrates the path to the Blackberry device. After retrieving key information about the call, like the caller ID, the PBX Monitor sends a notification message to a Blackberry device. This exchange is done through the Blackberry Enterprise Server (BES) using normal HTTP method with special HTTP parameters as shown in the Additional Design Details section.

4. Path (4) confirms that normal BES traffic continues to flow to the device at the same time as the new PBX Monitor notifications are going out to the user.

5. Path (5) takes place after the user responds with a message indicating their wishes. The user might choose to ignore the message or they might request the PBX Monitor to call their mobile phone and play the message just received. The call will either be to a default configured phone number, or to a number provided in the message from the user. The message number will be provided in the subject or body field of the reply so the PBX Monitor can retrieve the correct voice message to play back to the user.

6. Path (6) . . ."

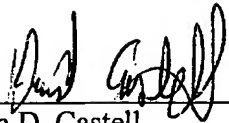
This described methodology shows conception of the broadest independent claims 1, 18, 53 and 71 of the present application in which a voice mail system receives a voice call and stores the voice message into a voice mailbox. Subsequently, a notification message is transmitting to a

wireless device via a wireless data network, the notification message indicating that the voice mail is stored in the user's voice mail box. The user of the wireless device then transmits a connection request command to the voice mail system via the data network, and in response thereto, a voice call is initiated to the wireless device in order to deliver the stored voice mail message.

This document also describes various setup details of the system (p. 6); monitoring features (p. 7); operational features (p. 8); a user interface at the mobile device for controlling the operations of the voice mail system (p. 9); a description of the operational functions (p. 10); and a discussion of additional functionality (p. 11).

2. From prior to December 4, 2000 until January 18, 2001, which is the filing date of provisional application (US 60/262,575) from which this application claims priority, we worked with our inside patent counsel and legal staff to review and finalize the provisional patent application. On information and belief, both the inside patent counsel and outside patent counsel were diligently working on this application up until the provisional application was filed on January 18, 2001.

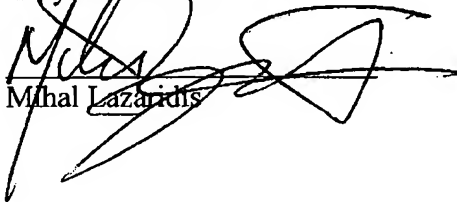
3. We hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

By:   
William D. Castell

Date: 25 Oct 2005

By:   
Gary P. Mousseau

Date: 25 Oct 2005

By:   
Mihai Lazaridis

Date: 28 Oct 05

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## The PBX Monitor

### Introduction

This request for proposal has been created to extend the RIM Blackberry solution to provide voice-mail notifications to Blackberry users on the road. By using the PBX Monitor when a user is on the road they will be notified whenever anyone leaves a message at the office. Once notified the user will have the ability to remotely control what the PBX Monitor does with each voice message that it has. The goal of the PBX Monitor is to connect to existing corporate PBX systems and provide a special Blackberry-enabled voice mailbox. The PBX Monitor will also provide early notification of voice mail and provide remote control over those voice messages. This notification of voice-mail will allow the user to have only one phone number and eliminate the user of paging systems completely.


Ideally the PBX Monitor should have an easy to install and easy to use philosophy, matching the experience users currently have with the Blackberry product line. The PBX Monitor will also be closely associated to the Blackberry Enterprise Server (BES) to help capitalizing upon the current Blackberry install base.

RIM is looking for a detailed quote from companies interested in implementing the PBX Monitor product. This should also include target costs, resources requirements and development timeframes to complete the work. RIM has selected companies that already have strong expertise in this area, so that they can draw upon their existing code base and experience to implement this solution in a timely fashion. The desired timeframes would be in the second quarter 2001.

### Overview of Blackberry

To help position the PBX Monitor it is important to fully understand the important selling points of the corporate Blackberry product line and service. Blackberry is primary a turnkey wireless e-mail service that provides a one-stop shopping method for a corporate user. The features of this turnkey service is that it provides a mirror to your corporate mailbox, where the user can take their corporate mailbox anywhere in North America in real-time.

First the user is notified in seconds or minutes of mail that has arrived to their corporate mailbox, in a way that is secure and approved by most fortune 500 companies. Second the user can fully respond, forward and react to the mail within minutes using a full keyboard for very fast message entry. Third the full exchange of messages with remote

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correspondence appears to have taken place at your desktop, keeping the user's location private if necessary. One of the strengths of the BES product is that its easy to install and use, with a security model that does not compromise security in any way.


Blackberry also provides a full Personal Information Management (PIM) solution, which allows the user to synchronize key data items to the device for permanent storage. This element uses a serial synchronization model that is expected now with PDA devices. Blackberry has also added over the air calendar support and advanced folder management support in the latest release, which will be the first offering of its kind using push notification.

## Extending the User Experience

The Blackberry user is normally already sold on the concept of e-mail notification and the real-time aspects of the e-mail to their belt. The PBX Monitor should be designed to extend that notification experience with another key piece of important information, incoming phone calls. The experience for the user should be something like:

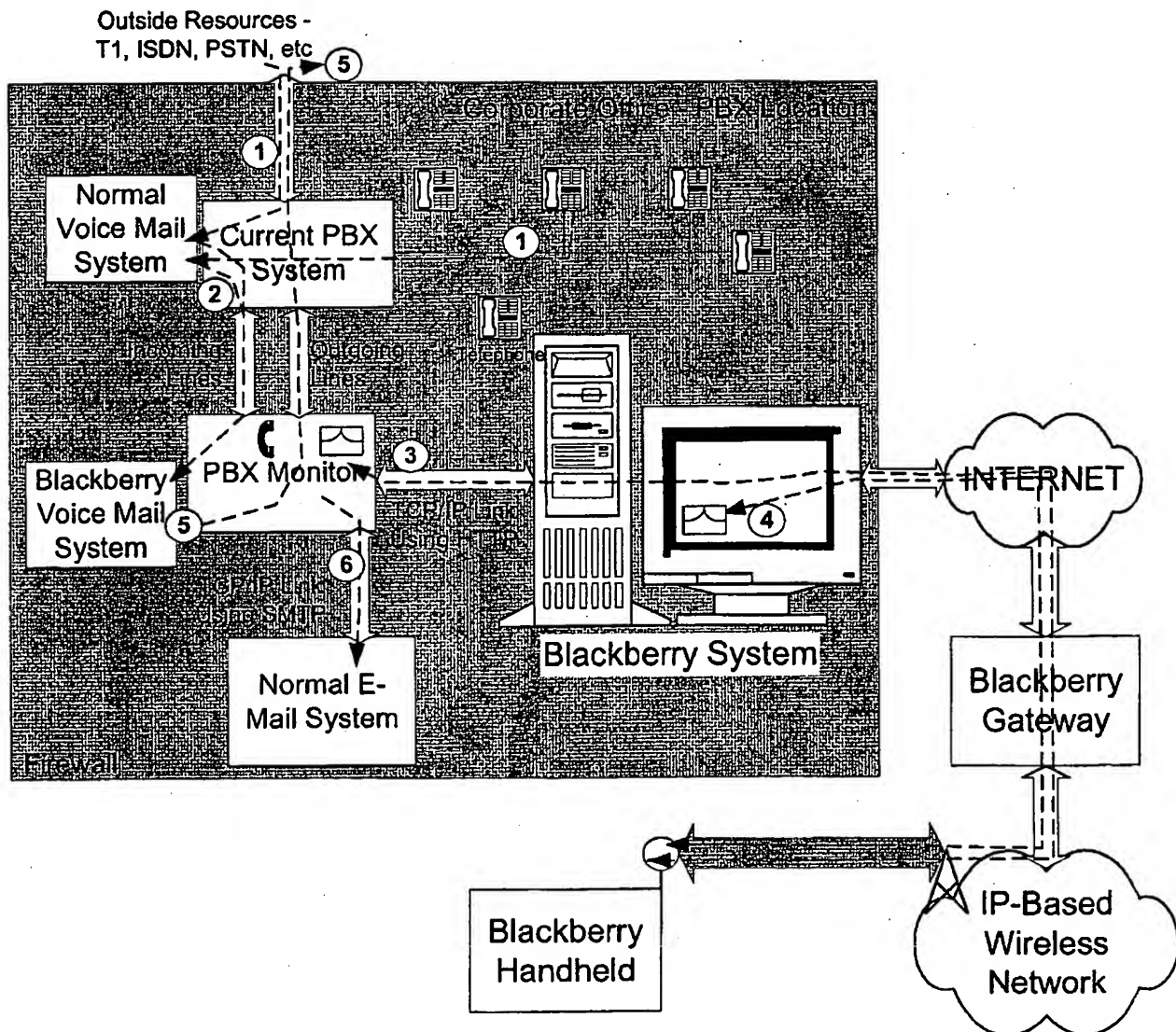
1. A call arrives into the office while the user is away, and the caller leaves voice mail.
2. A summary of the voice mail is immediately pushed to the Blackberry user with all information that can be retrieved from the caller Id and message.
3. The Blackberry user can respond to the voice-mail notification message with a command to the PBX Monitor to call him back and play the message on their cell phone.
4. The user should have the ability through DTMF tones to replay the message, delete the message, go to the previous message, go to the next message and all other normal controls provided in their existing voice-mail system.


The overall effect of the extended Blackberry system is the user has received a message, has selected an action on the Blackberry, and then has received the voice-mail immediately on their cell phone. By focusing on the simplicity of the solution, with a goal of entering the fewest possible keystrokes, the PBX Monitor's monitoring magic will be consistent with the current Blackberry solution.

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## TECHNICAL OVERVIEW

As the name suggests PBX Monitor sits within a corporation and monitors the activities of the PBX on behalf of certain configured 'Blackberry' users. It also allows the user to send back Blackberry messages to the PBX Monitor to create an end-to-end experience by controlling its operation. For every configured Blackberry user the PBX Monitor provides a mailbox that is closely tied to the Blackberry system.



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The following illustration helps position the components of the system and the steps necessary to create the necessary user experience:

The following diagram illustrates 6 main steps in the system being created, these include:

1. Path (1) shows phone calls arriving in from the office or from the outside world, all calls eventually reach the PBX and the PBX Monitor should monitor calls for Blackberry users.
2. Path (2) takes place if a call is not picked up, and the call is for a configured Blackberry user (based on extension), the PBX Monitor will divert the call to the Blackberry voice mailbox. **NOTE:** When this takes place the PBX Monitor should be flexible enough to emulate the existing voice mailbox methods for user interaction.
3. Path (3) illustrates the path to the Blackberry device. After retrieving key information about the call, like the caller ID, the PBX Monitor sends a notification message to a Blackberry device. This exchange is done through the Blackberry Enterprise Server (BES) using a normal HTTP method with special HTTP parameters as shown in the Additional Design Details section.
4. Path (4) confirms that normal BES traffic continues to flow to the device at the same time as new PBX Monitor notifications are going out to the user.
5. Path (5) take place after the user responds with a message indicating their wishes. The user might choose to ignore the message or they might request the PBX Monitor to call their mobile phone and play the message just received. The call will either be to a default configured phone number, or to a number provided in the message from the user. The message number will be provided in the subject or body field of the reply so the PBX Monitor can retrieve the correct voice message to play back to the user.
6. Path (6) since the Blackberry voice mailbox is different from the normal voice mailbox some features will be lost. For example group delivery and group addressing will not work, these are being considered low-use features. The other major lost will be message forwarding, i.e. when I get a call I want others to hear or that was not intended for me. In this case the PBX Monitor will forward the .WAV file in an e-mail message to the e-mail addresses provided by the Blackberry user.

Depending on the hardware and software requirements and complexity, it might be necessary to have a machine pre-created with the necessary software and hardware components. All these requirements should be stated in the proposal to access the complexity of the overall solution.



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Ideally the PBX Monitor uses existing resources, and where possible computer resources, already in the company. Connecting to an existing PBX within the company is also very important to reduce complexity in the sale.

## Further Considerations

In the average corporation there is a PBX running all or most of the phone system, normally across several branch offices. These systems come from a wide range of suppliers, primarily Nortel, Lucent, ROLM and AT&T. It is RIM's objective to connect Blackberry to these systems and provide early notification of voice mail that may be waiting for the user. As part of the discovery process it might be clear that connecting to the PBX is less important than connecting to the voice mail system.

The PBX Monitor should allow the user or system administrator to set all preferences and user configurations. Ideally this configuration should be accessible through an HTTP interface that will server up HTML pages (WML pages would be considered an asset). The software might come pre-loaded on a computer, depending on the complexity of the system, so the MIS department has a plug and play experience. Monitoring and statistics should also be available that summarize the actual notifications and handshakes with users.

The features provided thus far are considered necessary for stage one. However there is a second stage that might be considered, depending on the success of stage one.

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## Additional Design Details


Due to the impossible challenges of tracking voice messages by simply monitoring the PBX control information, the PBX Monitor offers a self contained voice mail system for a company that is using it. This section highlights the feature set required in replacing the mailbox for certain Blackberry users.

### Setup Features

During the setup phase a full GUI is provided to allow the MIS manager to quickly configure Blackberry users and their preferences. If possible it would be an advantage if the MIS administrator could select from the existing users when assigning Blackberry Mobitex Access Numbers (MAN) to phone extensions. Useful setup features might also include:

- **User Mapping:** each configured Blackberry user will have a mapping between their PBX extension and their Blackberry identifier. The Blackberry identifier will be their Device Number, which will be similar to an IP address.
- **Filter Lists:** similar to e-mail filter lists that allow users to indicate inclusive and exclusive phone numbers for forwarding voice mail notifications. Blackberry filter lists provide a good example of how this might work.
- **Default Phone Number:** provides the default phone number to call when the user requests that a phone message should be forwarded to them. This can be overridden when an explicit number placed in the reply to a voice mail notification.
- **Number of Rings:** as part of simulating the current voice mail system their must be configuration for the number of rings to allow before rolling the call over to voice mail.
- **Voice Prompts and Greetings:** to provide a voice mailbox their must default voice prompts and voice greetings that will be overridden by the user as they configure their mailbox.
- **Other Voice Mailbox Options:** as part of offering a mailbox there must be a range of other options associated to a mailbox that are less frequently used, these include options like: extended absence prompt and number of rings before indicating the phone is already busy.
- **Other Blackberry Options:** to help with delivery of notifications the operator will be allowed to set values on how often retries are tried. A retry is only needed if the device does not acknowledge receipt of the notification – see Operation Features section for more details.

The overall challenge in the setup phase is to mirror the existing voice mail system as closely as possible so incoming callers have a similar experience with Blackberry and non-Blackberry user's voice mailboxes.


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## Monitoring Features

As the system is turned on and starts to operate it has a line-side connection into the PBX. These connections are used for both incoming calls and outgoing calls. There must be a clear and configurable division between the two directions so that all incoming voice callers don't disrupt the ability to making outgoing calls. On the incoming call lines the PBX Monitor is re-routing incoming callers in order to 'simulate' the traditional voice mailbox. This could mean that if all circuits are busy that a voice caller could be missed and been recorded on the traditional voice mail system. These types of abnormal situations must be monitored and presented to the operator with other statistics. All statistics should be able to be cleared by the operator and written into a daily log that can be saved for historical purposes. During operation the following information should be available:

- **Voice Mail Calls Handled:** The total number of voice mail message handled by the system. There should also be the ability to drill down on this and look at how many were handled per configured Blackberry user.
- **Redirection Commands Processed:** The total number of redirection commands from Blackberry handhelds handled by the system. There should also be the ability to drill down on this and look at how many were handled per configured Blackberry user.
- **Circuit Congests:** The number of times all incoming or outgoing lines were used up with the time and date of the last occurrence of the event. These numbers will help the operator determine that they have not allocated enough circuits, given the number of users they are trying to configure in the system. There will be recommendations for circuit allocations but it is expected that companies will not always follow the recommendations.
- **Other Statistics:** It is expected that a range of other statistics will be available that is consistent with other voice-mail systems or phone-based add-on products of this nature. There will probably be statistics on the number of notifications that are outstanding and the number that have been acknowledged.
- **Mailbox Maintenance:** During normal operations it should be possible to perform some commands on a voice mailbox. The most important of these might be to 'reset' the mailbox and clear all pending messages. A user might use this if they have received a lot of voice messages, have listened to them but have not had time to delete them.

The goal during normal operation is to give the operator a good sense of how the system is running. Providing support for SNMP will be considered an asset. Writing real-time log files, i.e. Unix style monitoring, will also be considered an asset to the system. The challenge is to make the box fit into the monitoring style of the corporation so that monitoring is not a barrier to the sale.

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## Operational Features

During normal operation the system will have advanced features to help the system marry itself to Blackberry and to the PBX system within the company. To support the Blackberry system the PBX Monitor will be capable of support HTTP as both a client and a server. Since HTTP is so universally used within most products it should be easy to support it for Blackberry. In the opposite direction the Blackberry system will use HTTP to return replies to the PBX Monitor when a user responds to a message. As part of the contract to develop the PBX Monitor, it will be necessary for a protocol to be created on top of HTTP level. This protocol will be unique between the device application and the PBX Monitor program. Other features of the system include:

- **Construction:** When any message is placed in PBX Monitor's voice mailbox an SMTP message will be constructed for the configured user that owns that mailbox. The message will have call duration, caller ID, time and another other alphabetic information that could be part of the control information. The PBX Monitor will also have a unique numbering system per user so that every message is uniquely identified and referenced so that it can be retrieved later.
- **Transmission:** An HTTP method will be used for pushing the information to the device for the user. The device will always respond to each notification as described in the Response section below. The response to the HTTP request will confirm that the BES component has received the message – however this is not a guarantee of delivery. If for some reason the BES is down, or no acknowledgement is received from the device, then the PBX Monitor should be prepared to retry the notification at a later time.
  - RimDevice-PushProtocolVersion: 0 is being the current version
  - RimDevice-Pin: The Device ID of the destination device
  - RimDevice-ProtocolNumber: TCP/UDP – TCP for the notification and response
  - Content-Length: the data length being pushed to an application
- **Delivery:** The first stage of delivery is when the HTTP request is fulfilled with a response. This indicates that BES has the message and will do its best to deliver it to the device. If the BES fails for some reason, or the Blackberry Gateway fails then it is possible the message could be lost. It is important that the PBX Monitor save a copy of the notification message until an application level acknowledgement or response has been received.
- **Response:** When the notification arrives on the device a special application developed for voice messages receives the message first. The first step is to run a timer task and then to place a Voice Mail Notification in the users Inbox. The device will then notify the user and they will have the option of ignoring or opening the voice mail notification.
  1. If the user ignores the notification, and places the device back into the holster, the timer task will fire sending back a generic acknowledgment that the message has been received.
  2. If the user opens the notification and ignores it then the notification viewer (or the timer task) will send back a generic acknowledgment that the message has been received.



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3. If the user opens the notification and indicates they want to hear the message an acknowledgement is sent back with an indication that the PBX Monitor should call back the user and play the message.

The goal of the application on the device is to provide a consistent and easy to user interface and optimize all transmissions off the device. In effect the above three points are simply trying to piggyback the acknowledgement with the user's decision to hear the message.


- Call Back: The PBX Monitor will be prepared for an HTTP request to arrive into the HTTP Server component of the solution. After the request arrives an immediate response will be issues to terminate the HTTP handshake. Upon receiving the acknowledgement the PBX Monitor will open and examine the type of message that has been received. If the message is a generic acknowledgement the software will modify any statistics and delete the previously sent notification message since it has been delivered successfully. **NOTE:** Since notification messages are easily re-constructed this step might involve simply turning off a flag for a give voice message to indicate that it has been received.

If the message is a Call Back type acknowledgement then the PBX Monitor will extract the voice message number, look for a phone number to use in place of the default phone number and attempt to call the phone number selected. If no outgoing circuits exist and record of this is kept in the statistics area and the PBX Monitor attempts later to acquire a circuit. Once a circuit is acquired the call is made to the user.

- Message Playing: When the circuit is connected the PBX Monitor will issue several DTMF tones down the line to identify itself. These tones will have to be selected as part of the final details of the system operation. When supported the user will see a control panel similar to the following:

|   |          |        |        |
|---|----------|--------|--------|
| PLAY  | REWIND   | FFWD   | STOP   |
| PAUSE                                       | REPLAY   | DELETE | HANGUP |
| NEXT  | PREVIOUS | FIRST  | LAST   |
| Playing Msg #N: <caller Id> <Length> <Time> |          |        |        |

Each button will have an associated DTMF tone that corresponds to an action within the PBX Monitor. The lower status bar indicates which message the user is on and the caller Id information of that message when available. The status line will be managed by the application within Blackberry and will assist when the user starts deleting messages and moving around the list available messages in their voice mailbox.

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The message buttons will have the following effects on the PBX Monitor:

**PLAY:** Immediately plays the current message. When the PBX Monitor first calls the current message should always be the one requested by the user.

**REWIND:** Moves backwards approximately 5 seconds in the current message; pressing rewind twice quickly causes the user to be taken back to the very start of the message.

**FFWD:** Moves forward approximately 5 seconds in the current message; pressing forward twice quickly causes the user to be taken forward to the very end of the message.

**STOP:** Stops playing the current message and immediately moves to the next message. If there is no next message the first message is selected.

**PAUSE:** Pauses play of the current message and remembers the point where the playback was paused. Pressing PLAY or PAUSE again will restart the message from the same spot.

**REPLAY:** Moves back to the start of the message and immediately starts to replay the same message.

**DELETE:** Deletes the message within the PBX Monitor, which also updates the list of messages within the application's voice message sub-system on the device.

**HANGUP:** Terminates the call and causes the voice circuit to be disconnected.

**NEXT:** Moves to the next message and starts to immediately play that message.

**PREVIOUS:** Moves to the previous message and start to immediately play that message.

**FIRST:** Resets the current message pointer to the very first message in the PBX Monitor.

**LAST:** Resets the current message pointer to the very last message in the PBX Monitor.

**Note:** Since the voice mail application is a separate sub-system it should be possible to keep the PBX Monitor and the device's list of voice messages in synchronization at all times.



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## **Stage Two Functionality**

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The stage 2 functionality would involved more sophisticated control and command sequences back to the PBX Monitor. When implementing stage 2 features it is important that the user configuration allows stage one behaviour to remain intact, or to be extended as follows:

1. When calls arrive into the PBX Monitor the call will be held in stasis while sending the Blackberry notification out. When the notification is received, with caller id and other information, the user will have the choice of requesting the call be forwarded to another phone number.
2. In an effort to centralize billing, reduce features purchased on cell phones and reduce charges the user can send a command to the PBX Monitor to set up a conference call. This command packet will cause the PBX Monitor to call the user back at a specific phone number and call a second number and bridge the two calls.
3. Another advanced feature similar to 3 will be remote control over call routing. This includes turning the voice mailbox on and off, turning 'call stasis' behaviour on and off, turning automatic call redirection on and off and adjusting timeout lengths when waiting for redirection commands from the Blackberry device. These features are similar choices offered through a direct phone call interface, but with Blackberry it can be a one-touch operation.

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